IN THE CLAIMS:

Please CANCEL claims 40, 41 and 43-49 without prejudice to or disclaimer of the recited subject matter.

For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

1. (Previously Presented) A projection optical system for projecting an image of an object onto an image plane, comprising:

a first imaging optical system for forming an intermediate image of the object, said first imaging optical system including (i) a first lens unit having a positive power, (ii) a first optical unit having a first mirror for reflecting and collecting abaxial light from the object, (iii) a second optical unit having a second mirror for reflecting light from said first mirror to the image plane side, with which the abaxial light is caused to pass an outside of an effective diameter of said first mirror, and (iv) a second lens unit having a negative power and being disposed between said first and second mirrors;

a second imaging optical system for re-imaging the image upon the image plane; and

a field optical system disposed between said first imaging optical system and said second imaging optical system, for projecting a pupil of said first imaging optical system onto said second imaging optical system, said field optical system including a first field mirror unit having a first field mirror, a second field mirror unit having a second field mirror, and one positive lens disposed adjacent the image plane side of said first mirror.

2. (Original) A projection optical system according to Claim 1, wherein said first imaging optical system has a magnification β which satisfies a relation $|\beta| \geq 1$.

3-9. (Cancelled).

10. (Previously Presented A projection optical system according to Claim 1, wherein said second imaging optical system is constituted by lenses only and has a positive refracting power.

11. (Previously Presented) A projection optical system according to Claim 1, wherein said second imaging optical system has a magnification BG2 which satisfies a relation $-0.5 < BG2 < -0.05$.

12. (Previously Presented) A projection optical system according to Claim 1, wherein said first imaging optical system has a magnification BG1 which satisfies a relation $-40.0 < BG1 < -0.5$.

13. (Previously Presented) A projection optical system according to Claim 1, wherein said field optical system is all constituted by lenses.

14. (Cancelled).

15. (Previously Presented) A projection optical system according to Claim 1, wherein said first field mirror comprises a concave mirror and wherein said second field mirror comprises a convex mirror.

16. (Previously Presented) A projection optical system for projecting an image of an object onto an image plane, comprising:

a first imaging optical system for forming an intermediate image of the object, said first imaging optical system including (1) a first lens unit having a positive power, (ii) a first optical unit having a first mirror for reflecting and collecting abaxial light from the object, (iii) a second optical unit having a second mirror for reflecting light from said first mirror to the image plane side, with which the abaxial light is caused to pass an outside of an effective diameter of said first mirror, and (iv) a second lens unit having a negative power and being disposed between said first and second mirrors;

a second imaging optical system for re-imaging the intermediate image upon the image plane; and

a field optical system disposed between said first imaging optical system and said second imaging optical system, for projecting a pupil of said first imaging optical system onto said second imaging optical system, said field optical system including a first field mirror unit having a first field mirror with a concave surface, and a second field mirror unit having a second field mirror with a concave surface.

17. (Previously Presented) A projection optical system according to Claim 1, wherein relations $P1 < 0$ and $Pf+P2 > 0$ are satisfied where P1, Pf and P2 are Petzval sums of said first imaging optical system, said field optical system and said second imaging optical system, respectively.

18. (Previously Presented) A projection optical system according to Claim 1, wherein a relation $0.6 < e/LM1 < 2.5$ is satisfied where LM1 is a paraxial distance between the object and said first mirror, and e is a distance from the object to a pupil conjugate point defined by an optical element positioned at the object side of said first mirror.

19. (Previously Presented) A projection optical system according to Claim 1, wherein the distance LM1 satisfies a relation $0.5 < OIL/(LM1 + 2xLM2) < 20$, where LM2 is a paraxial distance between said first and second mirrors, and OIL is a paraxial distance along the optical path, from the object to the image defined by said first imaging optical system, wherein LM1 is a paraxial distance between the object and said first mirror, and LM2 is a paraxial distance between said first and second mirrors.

20. (Previously Presented) A projection optical system according to Claim 1, wherein the distances LM1 and LM2 satisfy a relation $0.2 < LM2/LM1 < 0.95$, wherein LM1 is a paraxial distance between the object and said first mirror, and LM2 is a paraxial distance between said first and second mirrors.

21. (Previously Presented) A projection optical system according to Claim 1, wherein the distance LM1 satisfies a relation $0.15 < LM1/L < 0.55$, where L is a distance from an object plane to an image plane in said projection optical system, wherein LM1 is a paraxial distance between the object and said first mirror, and LM2 is a paraxial distance between said first and second mirrors.

22. (Previously Presented) A projection optical system for projecting an image of an object onto an image plane, comprising:

a first imaging optical system for forming an intermediate image of the object, said first imaging optical system including (i) a first lens unit having a positive power, (ii) a first optical unit having a first mirror for reflecting and collecting abaxial light from the object, (iii) a second optical unit having a second mirror for reflecting light from said first mirror to the image plane side, with which the abaxial light is caused to pass an outside of an effective diameter of said first mirror, and (iv) a second lens unit having a negative power and being disposed between said first and second mirrors;

a second imaging optical system for re-imaging the intermediate image upon the image plane; and

a field optical system disposed between said first imaging optical system and said second imaging optical system, for projecting a pupil of said first imaging optical system onto said second imaging optical system, said field optical system including a first field mirror unit having a first field mirror, and a second field mirror unit having a second field mirror,

wherein said first optical unit has a magnification BGM1, which satisfies a relation $-1.2<1/BGM1<-0.2$.

23. (Previously Presented) A projection optical system according to Claim 1, wherein said first imaging optical system has a lens group having a positive refracting power and disposed closest to the object side of said projection optical system.

24. (Previously Presented) A projection optical system according to Claim 1, wherein said first optical unit includes a lens of negative refracting power and said first mirror.

25. (Previously Presented) A projection optical system according to Claim 1, wherein said second optical unit includes a lens.

26. (Previously Presented) A projection optical system according to Claim 1, wherein the abaxial light from the object passes through a lens of said second optical unit before it is incident on said first optical unit.

27. (Cancelled).

28. (Previously Presented) A projection optical system for projecting an image of an object onto an image plane, comprising:

a first imaging optical system for forming an intermediate image of the object, said first imaging optical system including (i) a first lens unit having a positive power, (ii) a first optical unit having a first mirror for reflecting and collecting abaxial light from the object, (iii) a second optical unit having a second mirror for reflecting light from said first mirror to the image plane side, with which the abaxial light is caused to pass an outside of an effective diameter of said first mirror, and (iv) a second lens unit having a negative power and being disposed between said first and second mirrors;

a second imaging optical system for re-imaging the intermediate image upon the image plane; and

a field optical system disposed between said first imaging optical system and said second imaging optical system, for projecting a pupil of said first imaging optical system onto said second imaging optical system, said field optical system including a first field mirror unit having a first field mirror, and a second field mirror unit having a second field mirror,

wherein a relation $0.45 < LFM1/LFM2 < 0.8$ is satisfied, where LFM1 is a distance between said second field mirror and said first field mirror, and LFM2 is a distance between said second field mirror and the image plane.

29. (Previously Presented) A projection optical system according to Claim 28, wherein said second field mirror group includes said second field mirror and a lens.

30. (Previously Presented) A projection optical system for projecting an image of an object onto an image plane, comprising:

a first imaging optical system for forming an intermediate image of the object, said first imaging optical system including (i) a first lens unit having a positive power, (ii) a first optical unit having a first mirror for reflecting and collecting abaxial light from the object, (iii) a second optical unit having a second mirror for reflecting light from said first mirror to the image plane side, with which the abaxial light is caused to pass an outside of an effective diameter of said first mirror, and (iv) a second lens unit having a negative power and being disposed between said first and second mirrors;

a second imaging optical system for re-imaging the intermediate image upon the image plane;

a field optical system disposed between said first imaging optical system and said second imaging optical system, for projecting a pupil of said first imaging optical system onto said second imaging optical system, said field optical system including a first field mirror unit having a first field mirror, a second field mirror unit having a second field mirror, and a field lens unit having a positive power;

wherein the field lens unit is disposed between the first mirror and the second field mirror.

31. (Original) A projection optical system according to Claim 1, wherein said projection optical system is telecentric with respect to each of the object side and the image plane side.

32. (Original) A projection optical system according to Claim 1, wherein said projection optical system has a magnification of reduction ratio.

33. (Original) A projection optical system according to Claim 1, further comprising a field stop disposed at the position of the image defined by said first imaging optical system, for changing at least one of a size and a shape of an imaging region upon the image plane.

34. (Original) A projection optical system according to Claim 1, further comprising a stop disposed inside said second imaging optical system.

35. (Previously Presented) A projection exposure apparatus for projecting a pattern of a mask onto a substrate through a projection optical system as recited in Claim 1.

36. (Original) A projection exposure apparatus according to Claim 35, wherein laser light from one of an ArF excimer laser and an F_2 excimer laser is used for the projection exposure.

37. (Previously Presented) A device manufacturing method, comprising the steps of:

printing a device pattern on a wafer by exposure, using a projection exposure apparatus as recited in Claim 35; and

developing the exposed wafer.

38. (Previously Presented) A projection optical system according to Claim 1, wherein said second imaging optical system includes two mirrors.

39. (Previously Presented) A projection optical system according to Claim 1, wherein said first and second mirrors adjoin along an optical path.

40-49. (Cancelled)

50. (Previously Presented) A projection optical system according to Claim 22, wherein said first imaging optical system, said second imaging optical system and said field optical systems are disposed along a common straight optical axis.

51. (Previously Presented) A projection exposure apparatus for projecting a pattern of a mask onto a substrate through a projection optical system as recited in Claim 16.

52. (Previously Presented) A device manufacturing method, comprising the steps of:

printing a device pattern on a wafer by exposure, using a projection exposure apparatus as recited in Claim 51; and

developing the exposed wafer.

53. (Previously Presented) A projection exposure apparatus for projecting a pattern of a mask onto a substrate through a projection optical system as recited in Claim 22.

54. (Previously Presented) A device manufacturing method, comprising the steps of:

printing a device pattern on a wafer by exposure, using a projection exposure apparatus as recited in Claim 53; and

developing the exposed wafer.

55. (Previously Presented) A projection exposure apparatus for projecting a pattern of a mask onto a substrate through a projection optical system as recited in Claim 28.

56. (Previously Presented) A device manufacturing method, comprising the steps of:

printing a device pattern on a wafer by exposure, using a projection exposure apparatus as recited in Claim 55; and

developing the exposed wafer.

57. (Previously Presented) A projection exposure apparatus for projecting a pattern of a mask onto a substrate through a projection optical system as recited in claim 30.

58. (Previously Presented) A device manufacturing method, comprising the steps of:

printing a device pattern on a wafer by exposure, using a projection exposure apparatus as recited in Claim 57; and

developing the exposed wafer.